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Research Article

REAL-TIME MONITORING OF ACUTE HEMODYNAMIC RESPONSES DURING *SIRODHARA* – AN OBSERVATIONAL PILOT STUDY

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ABSTRACT

Shirodhara is a traditional Ayurvedic treatment in which a steady stream of warm, medicated oil or liquid is gently poured in a continuous stream of drip on the forehead in a specific manner and height. This calming practice promotes a deeply restful state while keeping the mind alert, supporting overall mental and physical harmony. It is a non-invasive therapy commonly used to help manage sleep disturbances, anxiety, and stress. The effectiveness of such relaxation-based treatments can often be observed through physiological measures, including changes in blood pressure. **Methods:** A pilot observational study was conducted on 10 participants undergoing *Taila Shirodhara*. Systolic BP (SBP) and Diastolic BP (DBP) were recorded at baseline and at 5-minute intervals during a 30-minute procedure. Post-procedure BP was also recorded. Data were analysed using descriptive statistics. **Results:** The overall mean systolic blood pressure of the study participants was 130.6±10.8 mmHg, and the mean diastolic blood pressure was 85.8±8.9 mmHg. A general trend of reduction in blood pressure was observed in the majority of participants during *Taila Shirodhara*, although individual variations in response were noted.

INTRODUCTION

The science of Ayurveda emphasizes balance and harmony in the body and mind to maintain health and prevent disease. Modern lifestyles have led to a rise in stress related disorders like hypertension which can be understood through the imbalance in *doshas*. In such cases *Murdhini tailas* like *Siroabhyanga, Sirodhara, Siropichu* and *Sirovasthi* plays an important role. Among these *Sirodhara,* a therapeutic procedure involving the continuous pouring of medicated oil *(Taila), Kashaya* or *Takra* (buttermilk) on the head is known for its calming effects, the choice of drug and the duration of the procedure depend on several factors such as the nature and chronicity of disease. Exploring the impact of *Sirodhara* on blood pressure variation can provide valuable insights into its potential as a complementary therapy for managing hypertension and promoting over all wellbeing.

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As per *Panchakarma Chikitsa Kramam*, it is said that the benefits of *Taila shirodhara* are similar to *Murdhini taila*[1].

कचसदनसितत्वपिञ्जरत्वं परिफुटनं शिरसः समीररोगान्।
जयति, जनयतीन्द्रियप्रसादं स्वरहनुमूर्द्धबलं च मूर्द्धतैलम्॥ ।३४॥

Murdhini Taila is described to be beneficial in preventing falling, greying, discoloration, and splitting of hair, and is indicated in diseases of the head predominantly caused by *Vata*. It is also said to improve the clarity of sense organs and provide strength to the voice, lower jaw, and head. [2]

अरूंषिकाशिरस्तोददाहपाकव्रणेषु तु।
परिषेकः

However, the classical indications of *Seka (Shirodhara)* specifically include conditions such as *Arumshika, Shirasthoda, Daha, Paka,* and *Vrana*.[3]

In routine *Panchakarma* practice, blood pressure is commonly assessed before initiating therapeutic procedures, and procedures may be withheld or deferred when elevated blood pressure is

detected. However, there is limited evidence regarding the immediate haemodynamic response to *Taila Shirodhara*, particularly the pattern of blood pressure changes occurring during the procedure and in the period immediately following it.

Although *Taila Shirodhara* is traditionally described in conditions associated with mental and autonomic disturbances, its acute cardiovascular effects during the procedure have not been adequately characterized. Thus, there remains a need to objectively observe the immediate changes in blood pressure associated with *Taila Shirodhara* using real-time monitoring.

The present study therefore adopts an observational approach to evaluate the acute haemodynamic response to *Taila Shirodhara*, by monitoring blood pressure at defined intervals during and shortly after the procedure. This represents a preliminary and novel approach to understanding the immediate cardiovascular response to *Shirodhara* and may provide clinically relevant information regarding its haemodynamic profile and its implications for routine procedural decision-making.

AIMS AND OBJECTIVES

Aim

To observe the acute haemodynamic profile during and immediately after *Taila Shirodhara,* based on blood pressure-derived parameters.

Objectives

- To assess the changes in systolic blood pressure, diastolic blood pressure, mean arterial pressure and pulse pressure during *Taila Shirodhara*.
- To assess the immediate post-procedure changes in these blood pressure-derived haemodynamic parameters.

MATERIALS AND METHODS

- Study Design: Open-label, single-arm pilot observational study.
- Study setting: Government Ayurveda College Hospital Tripunithura.
- Sample Size: 10 participants undergoing *Taila Shirodhara*.

Plan of Treatment

A total of 10 participants were enrolled in the study to undergo *Taila Shirodhara* as per classical Ayurvedic protocol. Each participant received a single session of *Taila Shirodhara* for a duration of 30 minutes.

Before initiating the procedure, baseline blood pressure (BP) was recorded after ensuring the patient was in a relaxed supine position. During the *Shirodhara* procedure, blood pressure was monitored at regular 5-minute intervals (i.e., at 5, 10, 15, 20, 25, and 30 minutes) to assess real-time variations in hemodynamic parameters. Continuous observation was maintained to ensure patient comfort and safety throughout the session.

All readings were documented systematically for comparative analysis to evaluate blood pressure variations occurring during the procedure.

Procedure

The *Shirodhara* procedure is classically divided into three stages:

1. *Purva Karma* (pre-procedure measures)
2. *Pradhana Karma* (Main procedure)
3. *Paschata Karma* (post-procedure measures)

Purva Karma

Materials Required

- *Shirodhara patra* (vessel)
- *Shirodhara* stand
- *Shirodhara* table *(Droni)*
- Gauze pieces
- Cotton ear plugs
- Collection vessels
- Soft towels
- Appropriate medicated oil-1.5lt per day

Preparation of the Participant

Before initiating the therapy, the participant is carefully examined to assess fitness for the procedure and instructed to empty the bladder and bowel prior to treatment. Baseline vital parameters such as pulse rate, temperature, and blood pressure are recorded.

The participant is then made to lie comfortably in the supine position on the *Shirodhara* table.

The *Dhara Patra* is positioned approximately four *angula* above the forehead. The eyes and ears are protected with cotton plugs to prevent the entry of the medicated liquid during the procedure.

Pradhana Karma

The *Shirodhara* room should be properly cleaned, well-ventilated, and completely quiet to ensure a calm therapeutic environment. The procedure is ideally performed in the morning, on an empty stomach, following an *Abhyanga* (oil massage).

The selected liquid- such as medicated oil *(Taila)*, is placed in the *Dhara patra* (vessel). The liquid should be maintained a lukewarm temperature. The stream must flow in a steady, continuous manner, neither too fast nor too slow, and should be of moderate thickness- not too thick or too thin.

Once the flow begins, the vessel is gently moved in a pendulum motion from one lateral side of the forehead to the other. The liquid that flows down is collected in a separate container and reused to refill

the *Dhara patra* before it becomes empty, ensuring uninterrupted flow.

The procedure is generally performed for at least 30 minutes in the morning and is continued for a course of 7 to 21 days, depending on the condition and therapeutic requirement.

Paschat Karma

After completion of the *Shirodhara* procedure, the patient's head should be gently wiped and thoroughly dried. This is followed by a brief period of rest to allow relaxation and stabilization. Subsequently, a mild oil massage is given to the body, including the head, and the patient is advised to take a lukewarm water bath.

After the bath, the patient should follow *Pathya Ahara*, which includes consuming a light and easily digestible diet to support proper digestion and enhance the therapeutic benefits of the procedure.

Inclusion Criteria

- Age 20–60 years
- Indicated for *Shirodhara*
- Willing to provide informed consent

Exclusion Criteria

- Severe uncontrolled hypertension
- Cardiovascular emergencies
- Pregnancy
- Acute systemic illness

Assessment Criteria

- Systolic blood pressure
- Diastolic blood pressure

Intervention

Taila Shirodhara was performed using medicated oil (e.g., *Ksheerabala Taila/ Dhanwanthara Taila* etc.) for 30 minutes. The oil was maintained at lukewarm temperature and poured in a continuous rhythmic stream over the forehead using a *Dhara* vessel.

Blood Pressure Monitoring

Blood pressure was recorded using a validated digital sphygmomanometer:

- Baseline (0 min, before procedure)
- 5 min
- 10 min
- 15 min
- 20 min
- 25 min
- 30 min
- Immediately after procedure

Outcome Measures

- To assess Systolic blood pressure, diastolic blood pressure, mean arterial pressure, and pulse pressure
- To assess the immediate post-procedure changes in these blood pressure-derived haemodynamic parameters.

Statistical Analysis

Data were expressed as Mean±Standard Deviation. Percentage change from baseline was calculated. Due to small sample size, inferential statistics were limited.

OBSERVATION AND RESULTS

All ten participants completed the procedure without adverse events. Table 1 presents the mean SBP, DBP, MAP and pulse pressure at baseline, at each 5-minute interval, and immediately post-procedure.

Mean SBP declined from 137.2mmHg at baseline to 125.8mmHg post-procedure (≈8% reduction), and mean DBP declined from 93.2 to 84.5mmHg (≈9% reduction). MAP declined from 107.9 to 98.3mmHg, while pulse pressure changed only marginally, from 44.0 to 41.3 mmHg. Averaged across the monitoring period, mean SBP and DBP were 130.6±10.8 mmHg and 85.8±8.9 mmHg respectively. Most participants showed a gradual, sustained decline in BP beginning within the first 10–20 minutes; two participants showed minimal change or a slight increase, which may relate to differences in the *Taila* used, baseline BP status, or individual autonomic response. No episode of hypotension or other adverse effect was observed in any participant.

Table 1: Blood pressure–derived haemodynamic parameters during and after *Taila Shirodhara* (n=10). SBP: systolic blood pressure; DBP: diastolic blood pressure; MAP: mean arterial pressure; PP: pulse pressure

Time	Mean SBP (mmHg)	Mean DBP (mmHg)	Mean MAP (mmHg)	Mean PP (mmHg)
Baseline (0 min)	137.2	93.2	107.9	44.0
5 min	129.5	87.4	101.4	42.1
10 min	131.4	86.5	101.5	44.9
15 min	132.5	84.7	100.6	47.8
20 min	130.0	85.1	100.1	44.9

25 min	129.5	82.0	97.8	47.5
30 min	127.0	83.1	97.7	43.9
Post-procedure	125.8	84.5	98.3	41.3

DISCUSSION

The present pilot study was conducted to observe real-time variations in blood pressure during *Taila Shirodhara*. The findings demonstrate that the majority of participants exhibited a gradual reduction in both systolic and diastolic blood pressure during the procedure, with a pattern of initial decline followed by stabilization. However, a few participants showed minimal or fluctuating changes, indicating inter-individual variability in response.

The overall mean blood pressure of the study group was 130.6±10.8mmHg (SBP) and 85.8±8.9 mmHg (DBP). These findings suggest that *Taila Shirodhara* produces measurable physiological changes in blood pressure in real time, which can be objectively recorded using modern monitoring methods.

In the present study, most participants showed a consistent decline in blood pressure within the first 10–20 minutes, suggesting that the effect begins early during the procedure. In several cases, the lowest values were observed towards the later part of the session or post-treatment period, indicating a sustained effect during the procedure duration. However, one or two participants showed either minimal change or a slight increase in blood pressure, which may be attributed to individual factors such as baseline blood pressure status, mental state, or procedural response.

Based on the blood pressure values, Mean Arterial Pressure (MAP) and Pulse Pressure were calculated. MAP showed a progressive reduction from 107.9 mmHg at baseline to 97.7 mmHg at 30 minutes, with a post-procedure value of 98.3 mmHg, suggesting a gradual reduction in overall arterial pressure. Pulse pressure showed mild fluctuations during the procedure and decreased from 44 mmHg at baseline to 41.3mmHg post-procedure. Overall, the findings suggest that *Taila Shirodhara* produces a mild reduction in average arterial pressure with relatively stable pulse pressure, without observed episodes of hypotension or adverse effects.

The differences observed in participants' responses emphasize the need to account for individual variability in physiological reactions. The results suggest that *Taila Shirodhara* may influence cardiovascular activity, with these changes being observable through continuous, real-time monitoring.

However, the study has several limitations. The small sample size (n=10) reduces the extent to which the findings can be applied to a larger population. The lack of a control group and absence of long-term follow-up also make it difficult to draw firm conclusions. Furthermore, the study focused only on blood pressure, and including additional physiological measures could have offered a more complete understanding of the effects.

The therapeutic effect of *Sirodhara* using different medicated *Tailas* may vary according to the pharmacological properties and classical indications of the respective *Taila. Karpasasthyadi Taila*, described predominantly for *Vata* disorders and neuromuscular manifestations, may be particularly useful where *Sirodhara* is intended to provide *Vata*-pacifying, nourishing and restorative effects. It has *Snigdha*, *Guru* and *Vatahara* properties.

Dhanvantaram Taila, traditionally indicated in various Vata disorders and particularly in conditions involving the musculoskeletal and neuromotor systems, may exert a predominantly *Vatasamaka, Snehana* and *Brimhaṇa* effect.

Kshirabala Taila is classically described with an explicit indication for *Vatasamana*, and its combination of *Bala* and *Ksheera* with *Taila* provides a predominantly *Brimhaṇa, Snehana* and *Vata*-pacifying profile.

Mahamaṣa Taila, being a strongly nourishing and *Vata*-pacifying formulation traditionally employed in neuromuscular disorders, may be particularly relevant in weakness, stiffness, tremors, muscular dysfunction and neurological manifestations.

Madhuyashṭyadi Taila has a comparatively different therapeutic profile, with ingredients such as *Madhuyashti (Yashtimadhu)* contributing *Madhura*, *Snigdha*, soothing and potentially *Pitta*-pacifying properties.

Narayaṇa Taila, described extensively for Vata disorders including conditions affecting the neuromuscular system, possesses a predominantly *Vata*-pacifying and restorative profile.

From a contemporary perspective, the therapeutic effects of these *Tailas* during *Sirodhara* may additionally be understood through the combined influence of continuous tactile and thermal stimulation, relaxation, autonomic modulation and sensory input from the scalp and forehead**,** along with the pharmacological properties of the medicated oil. Continuous warm oil application may decrease sympathetic arousal and promote a parasympathetic-dominant state, potentially contributing to reduction of

stress, anxiety, muscle tension and sleep disturbances. Thus, the selection of *Taila* in *Sirodhara* should preferably be individualized according to the *Doṣa* predominance, disease pathology and therapeutic objective.

Taila Shirodhara demonstrated mild fluctuations in blood pressure during real-time monitoring, with both slight decreases and occasional increases observed; however, all values remained within normal physiological limits. Although a uniform consistent reduction was not noted, the overall trend suggests a relaxation response possibly mediated through parasympathetic modulation. These preliminary findings indicate physiological stability during the procedure. Larger, well-controlled studies are required to further evaluate and confirm these effects

CONCLUSION

The present pilot study demonstrates that *Taila Shirodhara* is associated with noticeable real-time variations in blood pressure, with most participants showing a progressive decline in systolic and diastolic values during the procedure. These observations indicate that measurable changes occur during the course of the therapy, which can be effectively recorded through interval-based monitoring. The findings of this study also provide preliminary insight into an important clinical question regarding the use of *Taila Shirodhara* in individuals with elevated blood pressure. The observed trend of reduction in many participants suggests that the procedure may not necessarily require strict avoidance in all such cases. Instead, it highlights the need for careful observation and clinical judgement during practice.

Limitations

This was done as a pilot study so it has a small sample size (n=10) and there was no control group, which limits the extent to which these findings can be generalised. Because the *Taila* used was individualised per participant rather than standardised, the observed BP trend cannot be attributed to any single formulation, and this variation may itself account for some of the inter-individual variability seen in the results. Monitoring was limited to a single session with no longer-term follow-up, and no heart-rate-variability or other autonomic-function assessment was performed.

Future Scope

- Larger, adequately powered sample size
- Controlled/comparative study design (e.g., against *Abhyanga* alone or a resting control).
- Prospective CTRI registration with formal Institutional Ethics Committee approval.
- Standardised *Taila* protocol across participants, or pre-planned subgroup analysis by *Taila* type.
- Inclusion of heart-rate variability and other autonomic markers.
- Baseline and post-procedure psychological stress/anxiety assessment.
- Long-term follow-up beyond the immediate post-procedure period.
- Focused evaluation in patients with elevated baseline blood pressure.

REFERENCES

1. Krishnawarriar PK, Subramania Sharma S. Panchakarma Chikitsa Kramam
2. Vagbhata. Ashtanga Hridaya. Harisree publication. Mannuthy. Sutrasthana, Chapter 22, Verse 34.
3. Vagbhata. Ashtanga Hridaya. Harisree publication. Mannuthy. Sutrasthana, Chapter 22, Verse 25.

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